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METHANOL AND ETHANOL VEHICLE INCENTIVES ACT OF 1985

AUGUST 1 (legislative day, JULY 16), 1985.—Ordered to be printed

Mr. DANFORTH, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

[To accompany S. 1097]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 1097) to amend the Motor Vehicle Information and Cost Savings Act to provide for the appropriate treatment of methanol, having considered the same, reports favorably thereon with amendments and an amendment to the title and recommends that the bill do pass.

PURPOSE OF THE BILL

The purpose of this legislation is to increase the availability of methanol and ethanol and the production of methanol and ethanol powered automobiles by providing for appropriate application of fuel economy standards to methanol and ethanol powered automobiles.

BACKGROUND AND NEED

METHANOL

Methanol has been commercially available since the mid-1800's. Until 60 years ago, it was made almost exclusively from the distillation of wood and received the nickname "wood alcohol". Today, methanol is manufactured primarily from natural gas, but it can also be produced from coal, biomass, or any other carbon-containing material, including trash or municipal waste. Methanol can be blended with gasoline as an octane enhancer, or produced as a neat fuel (generally considered a blend of 84 percent methanol and 15

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percent volatile hydrocarbon components) for use as a gasoline substitute.

The production of methanol from natural gas, coal, or biomass would improve the security of America's energy supply by reducing the Nation's dependence on imported oil. There is currently a large surplus of natural gas in the United States and other countries which can be cheaply and easily converted to methanol. Domestic coal can also be converted to methanol to provide long-term energy security. The known coal reserves in the United States are in excess of 489.5 billion tons, and underdeveloped coal reserves are estimated to be early inexhaustible.

METHANOL POWERED VEHICLES

The generally accepted definition of a methanol powered vehicle is one designed to operate on 85 percent methanol and 15 percent gasoline. Methanol is environmentally a superior fuel to traditional gasoline and diesel fuels. Methanol burns cleaner and at a lower temperature than gasoline and other fuels, although it has about one-half the energy content of gasoline per gallon. Methanol produces lower nitrogen oxides which may contribute to acid rain in our atmosphere. Methanol produces lower particulate emissions than diesel, gasoline, and industrial fuel oil. Methanol also produces relatively low reactivity of hydrocarbon emissions which contribute to ozone (smog). Methanol does produce formaldehyde emissions, which can be controlled by use of a catalytic converter.

Methanol, in an 85 percent methanol and 15 percent gasoline mixture as a substitute fuel for vehicles, suffers no significant safety disadvantages as compared to gasoline, performs better than conventional hydrocarbons in high-compression engines, can be stored and distributed conveniently, and burns with better thermal efficiency than gasoline. Methanol does corrode parts of the standard gasoline engine and has a high volatility point which makes it difficult to start in cold temperatures. However, these problems can be rectified by materials substitution and the addition of gasoline or other additives. Indianapolis 500 race cars presently use methanol because of its high efficiency and good performance.

Methanol's widespread use as a fuel substitute will depend largely upon its availability and competitive pricing in the U.S. market. The purpose of the bill is to encourage automobile manufacturers to produce methanol powered vehicles, to encourage the establishment of distribution systems for methanol, and to encourage consumers to buy methanol powered vehicles.

EXPERIMENTAL FLEETS OF METHANOL POWERED VEHICLES

There are experimental methanol powered vehicle fleets in operation around the country today. Bank of America in San Francisco, CA, has 288 vehicles converted to run on methanol; 252 are higher compression Ford vehicles, 35 are standard compression General Motors vehicles, and one is a 1984 Ford Crown Victoria, which utilizes a standard compression engine. The conversion cost for the higher compression Ford vehicles was $1,850 per vehicle. This expense was mostly related to increasing the compression ratio of the engine because alcohol burns more efficiently under high compres-

sion. The manufacturer's cost of producing methanol powered vehicles is expected to be comparable to that of conventional vehicles.

The 35 General Motors V-6 engines were converted at an in-house cost per vehicle of $320 for parts, and 4-6 hours of labor. Bank of America expects to save $1,234 per vehicle over their 100,000-mile life cycle due to fuel economy. Bank of America reports that, after 5 years and 15 million miles of operating methanol powered vehicles:

1. conversions are cost-effective and the auto industry can produce superior converted vehicles;
2. replacement parts are at a cost compatible to present gasoline vehicle parts;
3. performance and driveability are superior compared to gasoline vehicles (that is, more power, smoother idle);
4. all emissions categories are well within California standards;
5. cold start problems in seasonal climates can be corrected by vapor pressure additives; and
6. fuel and lubricant additives required in the methanol converted vehicle to protect against corrosion and to achieve better engine wear are comparable to gasoline engines.

Ford Motor Company has produced over 600 methanol powered vehicles and a flexible fuel vehicle. The flexible fuel vehicle is a 1985 Escort with a 4-cylinder fuel injection engine that can operate on methanol or gasoline, or any random mixture of the two. The car has an optional sensor that measures the percentage of methanol being supplied to the engine. No action is required by the driver other than to refuel the vehicle on whatever combination of fuels is available.

Ford's research department is addressing the issues of cold climate starts, the correct engine oil for the fuel combinations, and overall durability of the system. Ford believes these are relatively short-term problems. The Ford flexible fuel vehicle was driven by several Senators and staff members following the hearing on methanol on July 17, 1985.

ETHANOL

Ethanol, or grain alcohol, is primarily obtained from grain and other agricultural surpluses. Ethanol can also be produced from feedstocks, such as agricultural and municipal wastes, and forest products.

Today, an ethanol and gasoline mixture, popularly known as "gasohol", is available as an alternative fuel for vehicles on the market. The gasohol blend contains 10 percent alcohol and 90 percent gasoline, and is now sold in over 1,000 gasoline stations around the country. Ethanol has the best energy density of the alcohol fuels, and is also the least corrosive. Using ethanol as a fuel substitute may also be a potential solution for the problems of our Nation's agricultural surplus and dependence on foreign oil.

EXPERIMENTAL FLEETS OF ETHANOL POWERED VEHICLES

In 1976, Ford Motor Company participated with the government of Brazil in a government/industry project aimed at increasing the

use of ethanol as a transportation fuel. Brazil was severely impacted by the energy crisis in 1973 becaue it imported over 80 percnet of its petroleum, and elected to concentrate on ethanol as an alternative fuel because of its abundant supply of sugar cane, which can be used to produce ethanol. Ford produced experimental fleets of ethanol powered vehicles in 1977 and 1978, and introduced those vehicles for public sale in 1979. Today, about 98 percent of Ford Brazil's passenger cars and about 50 percent of its light passenger trucks are ethanol powered.

In the United States, Ford cars and light trucks have been designed to operate satisfactorily on gasoline blends containing up to 10 percent ethanol by volume. Ford Motor Company has indicated that the design and development of their methanol powered vehicles, including the impacts on U.S. emissions standards, can also be applied to ethanol powered vehicles.

LEGISLATIVE HISTORY

S. 1097 was introduced by Senator Danforth on May 8, 1985. The bill is cosponsored by Senators Riegle, Packwood, Ford, Specter, Melcher, Lugar, Levin, Chafee, Gore, Andrews, Rockefeller, Evans, and Exon.

The Committee on Commerce, Science, and Transportation held a hearing on S. 1097 on July 17, 1985. Witnesses at the hearing included representatives of the Federal Government and a diverse group of companies and trade associations interested in methanol as an alternative fuel for vehicles.

On July 18, 1985, the Committee without objection ordered S. 1097 reported with amendments proposed by Senator Long and cosponsored by Senator Exon, which included ethanol as a substitute fuel to be treated in the same manner as methanol for purposes of determining Corporate Average Fuel Economy (CAFE) standards. The Committee also discussed the possibility of including compressed natural gas an an alternative fuel substitute for vehicles. The Committee agreed to study and analyze the use of compressed natural gas as an alternative fuel in new cars designed with flexible fuel capabilities.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

U.S.CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, July 31, 1985.

Hon. JOHN C. DANFORTH,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Dirksen Senate Office Building, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed S. 1097, the Methanol Vehicle Incentives Act of 1985, as ordered reported by the Senate Committee on Commerce, Science, and Transportation, July 18, 1985. We estimate that this bill will

have no significant impact on the federal budget, or on the budgets of state and local governments in this projection period.

This bill would encourage the manufacture of methanol-powered automobiles by setting standards for determining the fuel economy of such vehicles. For the purpose of calculating a manufacturer's average fuel economy, the bill defines one gallon of methanol as equivalent to 15 percent of a gallon of gasoline. Thus, a methanol-powered automobile that averages 15 miles per gallon of methanol would be considered to have a fuel economy of 100 miles per gallon. Under existing law, the Secretary of Transportation prescribes average fuel economy standards for passenger automobiles, and manufacturers that do not comply with the standard we subject to fines. S. 1097 would permit a manufacturer to increase the average fuel economy of its cars by producing some of the higher economy methanol vehicles, thus possibly reducing fines that would be paid to the federal government for exceeding fuel economy standards.

Automobiles and buses operated on methanol are being used in several demostration programs, but are not yet in widespread use. In the future, however, if methanol is substituted for gasoline in a significant number of motor vehicles, Highway Trust Fund revenues and state gasoline taxes might be reduced. While this bill may encourage manufacturers to produce methanol-powered vehicles, it is not likely to have a significant impact in the next five years, in part, because of the time required to put a distribution system in place. Therefore, in the near future S. 1097 is unlikely to significantly reduce fines paid by manufacturers or revenues from gasoline taxes going to the Highway Trust Fund or to states.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,

Sincerely,

RUDOLPH G. PENNER, *Director.*

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported.

NUMBER OF PERSONS COVERED

Automobile manufacturers may be subjected to additional regulations imposed by the Environmental Protection Agency (EPA) and the Department of Transportation (DOT) when producing a methanol or ethanol powered vehicle. The addition of ethanol and methanol powered vehicles to the CAFE credit program administered by DOT will expand the scope of regulation, but should not result in the need for additional personnel.

ECONOMIC IMPACT

The Committee does not envision that any economic impact would be imposed upon consumers and businesses as a result of this bill.

PRIVACY

The bill will have no effect on the personal privacy of individuals.

PAPERWORK

The bill may result in limited additional paperwork to automobile manufacturers and DOT due to additional regulations that may be issued to accommodate methanol and ethanol powered vehicles.

SECTION-BY-SECTION ANALYSIS

SECTION 1—METHANOL AND ETHANOL VEHICLE INCENTIVES ACT OF 1985

The first section of the bill, as amended, provides that this act may be cited as the "Methanol and Ethanol Vehicle Incentives Act of 1985".

SECTION 2—FINDINGS

This section states that the Congress finds: (1) transportation uses account for more than 60 percent of the oil consumption of the Nation; (2) continued reliance on imported oil is detrimental to the economy and security of the United States; (3) methanol and ethanol are proven transportation fuels that burn more cleanly and efficiently than gasoline; and (4) conversion of a portion of the transportation fleet of the Nation to methanol and ethanol would stimulate development of a domestic coal-to-methanol industry, create jobs, reduce air pollution, and enhance national security.

SECTION 3—PURPOSE

Section 3 states the purpose of the act is to: (1) provide for the appropriate application of fuel economy standards to methanol and ethanol powered automobiles; and (2) increase the availability of methanol and ethanol and the production of methanol and ethanol powered vehicles to consumers.

SECTION 4.—MANUFACTURING INCENTIVES

Section 4 amends two sections of the Motor Vehicle Information and Cost Savings Act (MVICSA).

Paragraph (1) amends section 501 of the MVICSA, which sets forth definitions of terms for the MVICSA, by adding definitions of the terms methanol mixture, methanol powered automobiles, ethanol mixture, and ethanol powered automobiles. "Methanol mixture" means the mixture of methanol with other fuel, if any, used to operate a methanol powered automobile. "Methanol powered automobile" means an automobile capable of operating on not less than 85 percent methanol. The term "ethanol mixture" means the mixture of ethanol with other fuel, if any, used to operate an ethanol powered automobile. "Ethanol powered automobile" means an automobile capable of operating on not less than 85 percent ethanol.

It is the Committee's intent that flexible fuel cars which qualify for the special CAFE treatment under this bill will be the product of a design compromise between operation on gasoline and operation on the alternative fuel. The Committee also intends that cars which qualify for the CAFE credits using methanol or ethanol be designed to take advantage of the attributes of methanol and ethanol as to efficiency and performance. If the objectives of this bill are to be realized, a car qualifying under this bill must be designed so that use of the alternative fuel is an attractive option at the time when alternative fuels are more available in the market, thereby stimulating production and use of such alternative fuels.

Paragraph (2) amends section 503(d) of the MVICSA, to provide that, if a manufacturer produces methanol or ethanol powered automobiles, the fuel economy shall be based on the fuel content of the methanol or ethanol mixture used to operate the automobiles. A gallon of mathanol or ethanol fuel mixture used to operate methanol or ethanol powered automobiles shall, for purposes of this section, be considered to contain 15 one-hundredths of a gallon of fuel. For example, a methanol powered car operating on 85 percent methanol and 15 percent gasoline that gets 24 miles per gallon would achieve a fuel economy rating of 160 miles per gallon of gasoline (24 mpg $\times$1/.1.5).

For labeling purposes, the bill directs EPA to determine the fuel economy of methanol and ethanol powered automobiles to be 15 percent of the fuel economy calculated for these automobiles under section 503(d) (15 U.S.C. 2003(d)). Using the example above, a methanol powered car that achieves a fuel econoimy rating of 160 miles per gallon of gasoline would be labeled as obtaining 24 miles per gallon.

Changes in Existing Law

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new material is printed in italic, existing law in which no change is proposed is shown in roman):

The Motor Vehicle Information and Cost Savings Act

Section 501 of that Act

DEFINITIONS

Sec. 501. For purposes of this part:

(1)–(14) * * *

(15) The term "methanol mixture" means the mixture of methanol with other fuel, if any, used to operate a methanol powered automobile.

(16) The term "methanol powered automobile" means an automobile capable of operating on not less than 85 percent methanol.

(17) The term "ethanol mixture" means the mixture of ethanol with other fuel, if any, used to operate an ethanol powered automobile.

(18) The term "ethanol powered automobile" means an automobile capable of operating on not less than 85 percent methanol.

Section 503 of that Act

DETERMINATION OF AVERAGE FUEL ECONOMY

SEC. 503. (a)–(c) * * *

(d)(1)–(3) * * *

(4) If a manufacturer manufactures methanol powered automobiles or ethanol powered automobiles, the fuel economy shall be based on the fuel content of the methanol mixture or shall be based on the fuel content of the methanol mixture or ethanol mixture, as the case may be, used to operate such automobiles. For purposes of this section, a gallon of the methanol mixture or ethanol mixture, as the case may be, used to operate such automobiles shall be considered to contain 15 one-hundredths of a gallon of fuel.

"(5) For the purpose of labeling under section 506 (15 U.S.C. 2006), the EPA Administrator shall determine the fuel economy of a methanol powered automobile or ethanol powered automobile to be 15 percent of the fuel economy of such automobile as calculated under this subsection.

(e)–(f) * * * *

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